HAV Helmand Valley [redacted]

3

EVALUATION-HISTORY OF AID INVOLVEMENT IN HELMAND-ARGHANDAB VALLEY, AFGHANISTAN

By Arlene O'Rielly, NE/DP/PAE
September, 1979

CONTENTS

DRAFT

NE/DP/PAE:AO'Reilly:lcr:9/7/79

Lessons learned for Hill Exercise

1. Between 1946 and 1960 Morrison-Knudsen Company constructed two major dams - the Kajokai and the Arghandab in the Helmand Valley with Export-Import Bank and Afghan financing. (No U.S. financing.) The water stored in these dams was being used to no significant extent for irrigation nor electric power. This is a classic example of the backward approach to irrigation development, i.e., the dams were built first, then attention was given to preparation of lands to be irrigated, then to testing of soils, then to teaching the settlers how to irrigate, then to teaching the teachers. An important lesson to be learned is that as long as the river flow can be used to expand the irrigated area, surface water development should be used in this area, storage dams should be built as a last resort. (1973 History of the Helmand-Arghandab Valleys Project by USAID/Afghanistan, pg. 31-33.)

2. In the mid 60's as the responsibilities of HAVA grew, the administrative problems were further aggravated by the involvement of three major decision making bodies in the project, i.e., the foreign sponsor represented by USAID, the Royal Government of Afghanistan, and the regional Afghan development authority, requested by HAVA. Lines of communication and authority between the three often became blurred and project goals never became quite definite. As the administrators and technicians came and went, both Afghan and American, the programs

suffered from a lack of continuity. The lesson to be learned here is that there must be an agreed to overall plan defining exactly the concrete results it is intended to gain and how they are to be gotten. Needs should be foreseen in sufficient time to plan and organize required programs effectively.

3. In 1960 HVA eliminated the establishment of villages for new settlers in the Helmand Valley. Settlers had originally been located in villages for protection of families and their personal property, for association with friends and the convenience of praying in a mosque. After observing the efficiency of farming operations for a number of years and then querying the settlers themselves, HVA learned that more than half of the families indicated a preference for living on their farms rather than in the village. The lesson implied here is that the target audience of a project should be consulted in advance when changes are ~~to be~~ made in their living conditions.

4. The 1956 Tudor Engineering Report on Development of Helmand Valley (financed by ICA, AID's predecessor Agency) stated that the past estimates of irrigable land and the potential increases in the value of crop production which were being used to determine the economic feasibility of projects took for granted a high degree of farmer skills and efficiency which the Afghan farmers did not possess and were not likely to obtain in the foreseeable future. Although the farmer was generally a hard-working individual, farming techniques were crude and primitive. It is now generally recognized

that the economic feasibility of projects based on potential increases in the value of crop production must take in to account the farmers access to inputs such as short and medium-term credit, improved seed varieties and cultural practices, soil testing, fertilizer, water, appropriate mechanization, and incentives, etc.

Country: Afghanistan

Activity: Helmand-Arghandab Valley Development

Projects: Central Helmand Drainage (Phase II), 306-0149
Central Helmand Drainage (Phase I), 306-0146
Helmand Valley Soil and Water Survey, 306-0145
HAVA-HACU Equipment, 306-0102
Kajakai Hydroelectric, 306-0101 (1)
Helmand-Arghandab Valley Development, 306-0090
Helmand Valley Agriculture Development, 306-0060
Helmand-Arghandab Valley Electricity, 306-0041 (m)

Amount: Estimated $70 million

Time Period: 1952-1979

What was once a "bread basket" of Central Asia was by the twentieth century a vast, barren or scantily vegetated and populated land affected to varying degrees by salts, alkaline and erosion. Most historians argue that successive hoards of invaders had destroyed large cities and major irrigation canals. Others add that excessive forest utilization for fuel and brick firing resulting in deterioration of top soil, combined with long periods of drought summarily wiped out the population or forced migration.

Development of the Helmand Valley represents a major landmark in Afghanistan's economic progress. Over the years, U.S. projects have provided the training ground for most of the present Afghan professional irrigation development personnel and has given them valuable experience in planning, implementation and operation of a major land and water project. In spite of past difficulties, the Helmand Valley now makes an important contribution to the national economy, notably in supporting a rapidly growing cotton/textile complex and providing a substantial surplus of wheat available for the rest of the country.

AID inputs provided assistance:

(1) in developing the Helmand-Arghandab Valley Authority (HAVA) and the Helmand and Arghandab Construction Unit (HACU) into viable organizations. This included rehabilitation of inoperable earth-moving construction and related equipment; procuring new equipment, spare parts, materials and supplies; and providing technical supervisory and training services;

(2) in constructing a hydroelectric generating plant at Kajakai Dam and attendant facilities with technical supervisory and training services for the plant and for the newly created regulatory and administrative power agency;

(3) in developing an agricultural base that will support economic diversification;

(4) in creating an electric power system in the Helmand Valley and Kandahar regions;

(5) in constructing main and farm drains to reduce salinity and waterlogging in the Helmand Valley; and

(6) in training 369 Afghan counterparts in the U.S. and third countries over the period 1952-1974.

Specific gains to which our assistance has contributed include:

*Average net farm income grew from an equivalent of about $306 in 1970 to about $823 in 1975.

*Farmland under improved wheat increased from 6% in 1970 to some 44% in 1975.

*The utilization of tractors over animals for more intensive farming grew from less than 100 in 1969 to more than 1,000 in 1975.

*The total cropland increased from 130,060 hectares in 1970 to 150,000 hectares in 1975 with total land being cropped in any one year 104,000 hectares.

*The percent of cropland double-cropped grew from 5% in 1963 to 23% in 1975.

In 1952 the Royal Government of Afghanistan established the Helmand Valley Authority (HVA) as an autonomous organization to process new settlers into the Valley and to instruct them in improved cropping and water use practices. The first USG assistance, in 1952, was supplied by the U.S. Geological Survey to provide technical advisors to organize, train and develop functional activities of the HVA's new Hydrologic Unit. With the exception of the area around Kandahar, much of the area in the Valley remained sparsely populated with a few farms scattered along the river valleys. Initially 1,300 families were moved into the area, 90% of whom were impoverished kochis (nomads), who welcomed the opportunity to become independent landowners. It soon became apparent that the kochis were not trained in irrigation farming and their poor farm practices on marginal lands only aggravated the salt problem.

In mid-50's US technical assistance in agriculture and water resources development was provided to complement prior loan assistance by the Export-Import Bank for construction of reservoirs, power development and equipment. By 1961, with most of the Valley still used only by nomadic herdsmen who moved across it from Pakistan to the Russian border

in search of pasturage, 13 technicians with the U.S. Bureau of Reclamation arrived in Afghanistan to work on the critical problems of drainage and maintenance, and on the design and construction of irrigation systems.

The settling of new villagers continued with initially excellent crop yields gained on their farm. But the misuse of irrigation water, lack of adequate drainage and other poor agricultural practices progressively decreased these yields. Settlement problems were aggravated by confrontations with an already settled traditional agricultural community. The local power elites regarded the influx of new independent landowners as a threat, and although they hoped to benefit from additional water furnished by the dams, they resisted the Government's attempt to collect land and water revenues.

In the 1963-65 period farmer interviews were conducted to secure information on crop yields and factors affecting them. Farmers were asked whether their yields now were generally higher or lower than ten years earlier (before the irrigation works were built, or in the case of settlers, how their present yields compared with yields the first year they farmed their land). Percentages developed from these interviews ranged from 22 to 120 percent. Although the figures may not be strictly reliable, the opinions the farmers gave for yields being higher or lower were considered valuable. Reasons given for improved yields were: more water available, water available throughout the season, land more fertile as a result of using green manure, tractor plowing instead of oxen plowing, drains, and improved farm practices. Reasons given for lower yields were: less water available (possibly because the farmers on the upper reaches of laterals began farming more land when the dams and main canals assured a supply of water throughout the season, leaving less water for farmers down the ditch); silt that had formerly spread over the land to enrich the soil each spring was trapped behind the dam; increased water table, salt and drainage problems that had been accentuated as a result of building the major canals; inability to deal effectively with increased weeds, and reduced soil fertility as a result of continuous cropping which was possible with a dependable water supply; and cotton that they were now required to grow particularly reduced soil fertility. Other problems were the extremely difficult credit situation, lack of management know-how, education and basic knowledge.

In 1965 HVA was expanded to cover the Kandahar area and would henceforth be known as the Helmand-Arghandab Valley Authority (HAVA). Its responsibility was expanded to coordinate utilities, education, agricultural research, extension, housing, health and industrial development for the region.

By the mid-70's a transformation from subsistence to market-oriented farming was taking place, with incomes increasing at a fairly rapid rate. More than 75 of the farmers were using improved wheat varieties on some 44 of the farmland. Farmer incomes in the Helmand although lower than the national average increased 9 annually over the 1970-75 period.

As the network of irrigation canals expanded and water dependability increased, salinization and waterlogging became major problems. Most farmers in the Helmand over-irrigate their land, using far more water than crops need and the soils can accommodate. In 1974 a team from the U.S. Soil Conservation Service was contracted to assist in the construction of farm drains which would reduce waterlogging and salinity so the farmers could benefit from the full productive potential of their land. A social-economic evaluation of this phase, completed in July 1979, reports that more than 25% of the idle land was made useful by the installation of these farm drains. Double-cropping increased by more than 18% and yields per hectare for cotton, wheat, mung beans, etc., increased many fold.

Much still remains to be done if the gains of the past are to be consolidated. The education of farmers regarding correct water use, for example, will require a major effort by the extension service. Credit for both agriculture and non-agriculture purposes needs to be expanded.

USG assistance to Afghanistan is being terminated 9/30/79 in response to the Pell Amendment to the 1980 Foreign Assistance Act.

Historical Development of Helmand-Arghandab Valley

Arlene O'Reilly
Sept. 1979

The American "presence" in Afghanistan began in 1946 when the Royal Government of Afghanistan (RGA) contracted with the Morrison-Knudsen Company (MKA) for major transportation and canals system works exclusively in the Helmand-Arghandab Valley, costing the RGA $20 million for the first 3 years of construction work. The remainder of MKA's work was financed by Export-Import Bank loans totaling $39.5 million.

(Arghandab and Kajakai)

In 1959 when the MKA era ended, two technically first class dams had been completed as well as a series of main and lateral canals and drains, a system of roads linking the various projects, and a small electrification program. Over the 15-year period the area under cultivation had increased but production had not increased appreciably. Inadequate planning before land development began resulted in inadequate soil surveys and an underestimation of gypsum deposits, resulting in dumps at various places underneath and beside the canals. Waterlogging and salinity had a negative impact on yields. A by-product of the first 15 years of American presence in the Helmand Valley was the first major English language program in Afghanistan.

Foreseeing the need to salvage the Helmand-Arghandab Valley project -- which had become identified as an American project, ICA (AID's predecessor) decided to undertake the first independent engineering study of the HV project. The project had absorbed an average of 19 of the total Afghan development expenditures for several years and the Afghans were determined to succeed.

Success must necessarily include equitable laws formulated and enforced, updating tribal laws, i.e., grazing rights and rights of trespassers, laws to prevent theft of devices, i.e., irrigation check boards or plates, pipes, posts, engineer's stakes, etc. The need for physical facilities, i.e., offices, laboratories, warehouses, residences, etc. Upgrading and streamlining administrative functions throughout the HVA and HACU organizations. Teaching farmers proper land leveling, leaching and drainage, seeding, tillage practices and fertilizer use.

The Tudor Report formed the basis for priorities assigned to various portions of the project and the necessary financing over the next five years. An agreement to provide $19 million was signed in 1958 for rebuilding and asphalt surfacing of 549 kilometers of road that would provide tax free transit and a great saving of time for exports and imports moving between Kabul and Karachi.

Before MKA actually left the Valley, the Afghan Construction Unit (ACU) was created as a division within HVA to carry on land development work such as construction of laterals, secondary and farm drains and land leveling. In 1964 the organization was renamed Helmand-Arghandab Construction Unit (HACU).

Unnoticed by the developers was the gradual shift in the scope and direction of the project and the emergency of new social and institutional problems. Originally there was a strong desire in the RGA to develop the publicly owned desert lands to provide opportunities for settling nomads and landless farmers. The provision

of water to lands in private ownership and already under irrigation was clearly incidental. By the mid-1960's the situation had completely changed as most of the land that could be successfully developed was now in private ownership. The social and legal implications of providing private landlords with an assured and greater supply of water demanded extensive study. Finding solutions to problems of existing land titles, water rights and related problems of payment for water supplied were still a delicate subject ~~in the underbelly of the Helmand~~ Arghandab ~~development~~ in the early 70's.

In the mid-60's HAVA, under a new charter, was given responsibility for industrial development plus the coordination of utilities, education, agricultural research and extension, housing and health. Administrative problems were aggravated by the involvement of three major decision making bodies, i.e., the USAID, the RGA, and the HAVA. Lines of communication and authority between the three were often blurred and project goals were never quite definite with the result that there was no agreed to overall plan defining exactly the concrete results and how they were to be gained. Needs were not foreseen in sufficient time to plan and organize required programs effectively. Administrators came and went, whether Afghans or Americans, with programs suffering from a lack of continuity.

Insufficient attention was paid to the problem of adequate drainage and, as a consequence, the quantity of land being irrigated declined and some land under the command of the irrigation system became

unusable. Farms that should have produced a respectable living by Afghan standards deteriorated to the point where some families were barely existing and others had to abandon their land.

In 1974, the USAID and Afghan Government decided to tackle the problem in three phases. In Phase I, 40 kilometers of main drainage canals and 60 kilometers of farm drains were completed. Phase II was to reduce salinity and water logging in 130 square kilometers of farm land and to increase productivity, income and employment of small-scale farmers and farm laborers. Phase III, not yet designed, was to address the problem of water management.

Documents Reviewed

1. Report on Development of Helmand Valley, Afghanistan by Tudor Engineering Company, Washington, D.C., financed by International Cooperation Administration and published November 1956.

By October 1957, when it had become increasingly evident that the Helmand-Arghandab Valley was being identified as an American project and that earlier costs were grossly underestimated and returns overestimated, ICA (AID's predecessor) decided to undertake the first independent engineering study made of the Helmand Valley project. The Tudor Report brought together into workable and debatable form most of the relevant information available to that date. It recommended a two-phase program. One discussed the constructions that were nearing completion, while phase two considered the work that could be deferred for a number of years.

Tudor Report recommended (1) investments to remove constraints to increased production such as an expanded extension program, rural development, education, public health, farm credit program, public administration assistance, and the encouragement of handicraft and industrial expansion; and (2) the creation of an integrated transportation system linking the Helmand Valley with Pakistan and the port of Karachi.

Result was the 14 man Bureau of Reclamation team to implement recommendation one, and the $19 million loan to rebuild and construct asphalt surfacing on 549 kilometers of roads in Afghanistan.

2. TOAID A-969, dated 1/10/63, a case history report of the Helmand Valley Water Investigations project.

3. USAID Position Paper on an accelerated Helmand Valley Development, dated 2/6/65, stated that the RGA and the USG had reached a complete psychological impasse. The RGA was not convinced about the need for more planning. Since they did not understand land classification, they thought the reconnaissance done by MKA should be adequate; that the advantages of rapid completion would outweigh possible risks of developing small amounts of poor land; that marketing problems could be solved as they occur; that the U.S. approach was a stall and possibly an indication that the U.S. meant to pull out of the Helmand Valley.

The USG's hesitancy to make a further commitment at this time grew out of their concern about the lack of planning and the extent of the job to be done. They were propsoing an economic planning team to develop a practical completion schedule and a project planning team to do land classification, drainage analysis, preliminary engineering and economic analysis to determine costs and benefits for 10,000 acres a year with an equipment loan to permit the HVA to continue operating in the meantime.

(13)

4. Economics of Agriclutural Production in Helmand Valleys by I.M. Stevens, U.S. Bureau of Reclamation and K. Tarzi, HVA, Helmand Valley Development Project, Afghanistan, October, 1965.

Study was undertaken over the period 1963-1965 to secure badly needed information on crop yields in the Helmand Valley and factors affecting them; also to compare production now and before the loans and irrigation works were built. Mr. Stevens was the first agricultural economist with the Bureau of Reclamation team in Afghanistan.

5. TOAID A-1236, Final Report on Helmand Valley Agricultural Development, project 306-060, dated 6/21/66.

6. 1970 Farm Economic Survey, Helmand and Arghandab Valleys of Afghanistan, by G. P. Owens, USAID/University of Wyoming Contract Team, 12/15/71.

Study reveals progress in agriculture of the Helmand-Arghandab Valley Region. It shows that double-cropping is becoming extensive, that wheat yields are rising rapidly with the large scale introduction of high-yielding varieties on the use of fertilizer, and that the settlers are starting to shift towards fruits and other high value crops. It also provides a base for estimating agricultural income, revealing that it has become sufficiently substantial and that efforts at local resource mobilization for further growth would be very worthwhile.

7. USAID's 1973 History of the Helmand-Arghandab Valleys Project. (Summary of the Helmand-Arghandab Valley Integrated Farmer-Intensive Development.)

The study shows that the investment in the Helmand-Arghandab Valley has now resulted in a basic infrastructure capable of maintaining satisfactory "water command" of the existing major project areas; that the farmers have taken the critical first step required to move from subsistance farming to the management of modern inputs -- fertilizer, improved seed, tractors, etc. -- required for commercial farming able to produce a significant surplus. The optimum potential of the Valley cannot be achieved in the near term unless a concentrated farmer-intensive, technical assistance effort is undertaken, aimed at correcting the human resources deficiencies of the farmers and the bureaucracy. The Valley already ranks first in the percentage of irrigated cropland using improved seeds, fertilizer, tractors and farm machinery -- to the extent of becoming a major surplus grain exporting region for the rest of the country. An intensive effort at accelerating human resource development, crop-diversification, double-cropping, land levelling and better on-farm water management could rapidly increase agricultural output of high value, exportable crops, by establishing an effective farmer information system and upgrading the competence of the HAVA staff.

(14)

8. USAID's 1975 Farm Economic Survey of the Helmand Valley attempts to gather and analyze relatively detailed data to reflect the socio-economic conditions of the rural people living and working in the Helmand Valley. While the survey shows that the farmers are increasingly being transformed from subsistance cultivation to market-oriented farmers and incomes are increasing at a fairly rapid rate, water use practices for the most part have failed to keep pace with the new technologies. Salinization and water-logging have become major problems since almost all farmers over-irrigate their land, using far more water than their crops need and their soils can accommodate. ~~Anotehr~~ problem is insects. Little research has been conducted so that farmers are relatively unaware of how to prevent infestation, detect the presence of pests, or to treat their crops. Insecticides are both limited and expensive. A third problem is credit. In addition to loan credits supplied by the Agricultural Development Bank for purchase of fertilizer, many farmers are in need of other types of loans.

The 1975 Farm Economic Survey can also be used as a benchmark for future planning and evaluation and to measure the progress of development efforts in the Helmand since it improves and replicates two similar studies completed in 1965 and 1970.

9. USAID's In-Depth Evaluation of Central Helmand Drainage Project, Phase I, 7/31/76, revealed that a close working relationship existed among the USAID, HAVA and the U.S. Soil Conservation Service team who was implementing the project. This relationship, however, had produced only limited results in terms of farm drain and main drain construction. The soils laboratory was not yet fully operational and a qualified soil scientist was yet to be assigned to the laboratory. The evaluation concluded that there was insufficient basis to recommend a go-ahead decision on Phase II until physical output was expanded and planning for Phase II had produced clearly delineated implementable project content. One of the major problems identified was a lack of forceful, continuous, full-time management on the part of USAID.

The Evaluation recommended, inter alia, that USAID management should clearly define the roles and responsibilities of the Project Officer in Kabul and of the Project Adviser in Lashkar Gah; that SCS should restructure team roles so that one member is responsible for advising HAVA on master drainage planning; that HAVA should identify where, within its organization, responsibility for detailed master drainage planning should be placed.

10. USAID's Socio-Economic Evaluation of Central Helmand Drainage Project, Phase I, July 1979, showed that farm production had increased substantially in the years following the installation of drains; that more than 25% of the idle land had been made useful; and that double-cropping increased by more than 18%. Yields per hectare for cotton, wheat, mung beans, etc., increased many fold.

(15)

11. The USAID's Farm Economic Survey planned for 1980 has been postponed indefinitely due to the termination of U.S. development assistance to Afghanistan 9/30/79.

Country: Afghanistan

Activity: Helmand-Arghandab Valley (HAV) Development

Projects: Central Helmand Drainage (Phase II), 306-0149
Central Helmand Drainage (Phase I), 306-0146
Helmand Valley Soil and Water Survey, 306-0145
HAVA-HACO Equipment, 306-0102
Kajakai Hydroelectric, 306-0101 (1)
Helmand-Arghandab Valley Development, 306-0090
Helmand Valley Agriculture Development, 306-0060
Helmand-Arghandab Valley Electricity, 306-0041 (m)

Amount: Estimated $70 million

Time Period: 1952-1979

What was once a "bread basket" of Central Asia was by the twentieth century a vast, barren or scantily vegetated and populated land affected to varying degrees by salts, alkaline and erosion. Most historians argue that successive hoards of invaders had destroyed large cities and major irrigation canals. Others add that excessive forest utilization for fuel and brick firing resulting in deterioration of top soil, combined with long periods of drought summarily wiped out the population or forced migration. (1973 USAID History of the Helmand-Arghandab Valleys Project)

Helmand Valley Development represents a major landmark in Afghanistan's economic progress. The project has provided the training ground for most of the present Afghan professional irrigation development personnel and has given them valuable experience in planning, implementation and operation of a major land and water project. In spite of past difficulties, the Helmand Valley now makes an important contribution to the national economy, notably in supporting a rapidly growing cotton/textile complex and providing a substantial surplus of wheat available for the rest of the Country.

AID inputs provided assistance:

(1) in developing the Helmand-Arghandab Valley Authority (HAVA) and the Helmand a..d Arghandab Construction Unit (HACU) into viable organizations. This included rehabilitation of inoperable earth-moving construction and related equipment; procuring new equipment, spare parts, materials and supplies; and providing technical supervisory and training services;

(2) in constructing a hydroelectric generating plant at Kajakai Dam and attendant facilities with technical supervisory and training services for the plant and for the newly created regulatory and administrative power agency;

(3) in developing an agricultural base that will support economic diversification;

(4) in creating an electric power system in the Helmand Valley and Kandahar regions; and

(5) in constructing main and farm drains to reduce salinity and waterlogging in the Helmand Valley.

(6) in training [illegible] Afghan participants in the U.S. and third countries over the period 1952-1974. (1975 Participant Training Directory for Afghanistan, DS/IT)

Specific gains to which our assistance has contributed include:

*Average net farm income grew from an equivalent of about $306 in 1970 to about $823 in 1975.

*Farmland under improved wheat increased from 6% in 1970 to some 44% of the land under new varieties in 1975.

*The utilization of tractors over animals for more intensive farming grew from less than 100 in 1969 to more than 1,000 in 1975.

*The total cropland increased from 130,060 hectares in 1970 to 150,000 hectares in 1975 with total land being cropped in any one year 104,000 hectares.

*The percent of cropland double cropped grew from ~~6%~~ 7% in ~~1963~~ 1970 to 23% in 1975.

In 1952 the Royal Government of Afghanistan established the Helmand Valley Authority (HVA) as an autonomous organization to process new settlers into the Valley and to instruct them in improved cropping and water use practices. The first USG assistance, in 1952, was supplied by the U.S. Geological Survey to provide technical advisors to organize, train and develop functional activities of the HVA's new Hydrologic Unit. With the exception of the area around Kandahar, much of the area in the Valley remained sparsely populated with a few farms scattered along the river valleys. Initially 1,300 families were moved into the area, 90% of whom were impoverished kochis (nomads), who welcomed the opportunity to become independent landowners. It soon became apparent that the kochis were not trained in irrigation farming and their poor farm practices on marginal lands only aggravated the salt problem.

In mid-50's US technical assistance in agriculture and water resources development was provided to complement prior loan assistance by the

Export-Import Bank for construction of reservoirs, power development and equipment. By 1961, with most of the Valley still used only by nomadic herdsmen who moved across it from Pakistan to the Russian border in search of pasturage, 13 technicians with the U.S. Bureau of Reclamation arrived in Afghanistan to work on the critical problems of drainage and maintenance, and on the design and construction of irrigation systems.

The settling of new villagers continued with initially excellent crop yields gained on their farm. But the misuse of irrigation water, lack of adequate drainage and other poor agricultural practices progressively decreased these yields. Settlement problems were aggravated by confrontations with an already settled traditional agricultural community. The local power elites regarded the influx of new independent landowners as a threat, and although they hoped to benefit from additional water furnished by the dams, they resisted the Government's attempt to collect land and water revenues.

In the 1963-65 period farmer interviews were conducted to secure information on crop yields and factors affecting them. Farmers were asked whether their yields now were generally higher or lower than ten years earlier (before the irrigation works were built, or in the case of settlers, how their present yields compared with yields the first year they farmed their land). Percentages developed from these interviews ranged from 22 to 120 percent. Although the figures may not be strictly reliable, the opinions the farmers gave for yields being higher or lower were considered valuable. Reasons given for improved yields were: more water available, water available throughout the season, land more

fertile as result of using green manure, tractor plowing instead of oxen plowing, drains, and improved farm practices. Reasons given for lower yields were: less water available (possibly because the farmers on the upper reaches of laterals began farming more land when the dams and main canals assured a supply of water throughout the season, leaving less water for farmers down the ditch); silt that had formerly spread over the land to enrich the soil each spring was trapped behind the dam; increased water table, salt and drainage problems that had been accentuated as a result of building the major canals; inability to deal effectively with increased weeds, and reduced soil fertility as a result of continuous cropping which was possible with a dependable water supply; and cotton that they were now required to grow particularly reduced soil fertility. Other problems were the extremely difficult credit situation, lack of management know-how, education and basic knowledge.

In 1965 HVA was expanded to cover the Kandahar area and would henceforth be known as the Helmand-Arghandab Valley Authority (HAVA). Its responsibility was expanded to coordinate utilities, education, agricultural research, extension, housing, health and industrial development for the region.

By the mid-70's a transformation from subsistence to market-oriented farming was taking place, with incomes increasing at a fairly rapid rate. More than 75% of the farmers were using improved wheat varieties on some 44% of the farmland. Farmer incomes in the Helmand although lower than the national average increased 9% annually over the 1970-75 period.

As the network of irrigation canals expanded and water dependability increased, salinization and waterlogging became major problems. Most farmers in the Helmand over-irrigate their land, using far more water than crops need and the soils can accommodate. In 1974 a team from the U.S. Soil Conservation Service was contracted to assist in the construction of farm drains which would reduce waterlogging and salinity so the farmers could benefit from the full productive potential of their land. A social-economic evaluation of this phase, completed in July 1979, reports that more than 25% of the idle land was made useful by the installation of these farm drains. Double-cropping increased by more than 18% and yields per hectare for cotton, wheat, mung beans, etc., increased many fold.

Much still remains to be done if the gains of the past are to be consolidated. The education of farmers regarding correct water use, for example, will require a major effort by the extension service. ~~Low-interest~~ Credit for both agriculture and non-agriculture purposes needs to be expanded.

USG assistance to Afgahnistan is being terminated 9/30/79 in response to the Pell Amendment to the 1980 Foreign Assistance Act.